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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,321	07/23/2003	Peter Michael Edie	120521-2/YOD GERD:0052	7756
41838 7590 12/24/2008 GENERAL ELECTRIC COMPANY (PCPI) C/O FLETCHER YODER P. O. BOX 692289 HOUSTON, TX 77269-2289			EXAMINER HO, ALLEN C	
			ART UNIT 2882	PAPER NUMBER
			MAIL DATE 12/24/2008	DELIVERY MODE PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER MICHAEL EDIC,
BRUNO DE MAN, and SAMIT BASU

Appeal 2008-4241
Application 10/625,321
Technology Center 2800

Decided: December 24, 2008

Before CHUNG K. PAK, CATHERINE Q. TIMM, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1-7, 9-15, 17-23, 25, and 26. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

The invention relates to a) a method for acquiring projection data using a rotating X-ray source, b) a computer program on computer readable medium including a routine for rotating the X-ray source, and c) a CT (computed tomography) image analysis system. Claim 1 is illustrative:

1. A method for acquiring a projection data set, comprising:

rotating a distributed X-ray source about a volume of interest, wherein a rotational period of the distributed X-ray source is greater than eight seconds and wherein the distributed X-ray source comprises a plurality of addressable X-ray focal spots;

emitting X-rays from the distributed X-ray source; and

acquiring a projection data set comprising a plurality of projections generated from the emitted X-rays.

A copy of the remaining claims under appeal is set forth in the Appendix to the Appellant's Brief.

The Examiner relies upon the following prior art references as evidence of unpatentability:

Morgan	US 6,229,870 B1	May 08, 2001
Casey	US 5,175,754	Dec. 29, 1992
Yamagishi	US 5,383,231	Jan. 17, 1995
Taguchi	US 6,446,640 B1	Oct. 15, 2002

The Examiner rejected all the claims under 35 U.S.C. § 103(a) as follows:

1) Claims 1, 9, 17, and 25 as being unpatentable over Morgan in view of Casey;

2) Claims 2-5, 10-13, 18-21, and 26 under 35 U.S.C. § 103(a) as being unpatentable over the combined teachings of Morgan, Casey, and Yamagishi;

3) Claims 6, 7, 14, 15, 22, and 23 as being unpatentable over the combined teachings of Morgan, Casey, Yamagishi and Taguchi.

Appellants do not argue any of the claims separately with any reasonable specificity (App. Br. 6-13; Reply Br. 2-8). Therefore, we select independent claim 1 to decide the issue in the first ground of rejection on appeal. 37 C.F.R. § 41.37(c)(1)(vii)(2006). Also, Appellants do not present additional substantive arguments for any of the groups of depending claims separately rejected under 35 U.S.C. § 103 by the Examiner.

Accordingly, we will limit our consideration to the Examiner's rejection of claim 1.

ISSUE

The issue on appeal is whether Appellants have established that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103 because:

- (a) the claimed feature of “a rotational period of the distributed X-ray source is *greater than* 8 seconds” is missing from the references (claim 1; emphasis provided);
- (b) there is no motivation to combine the Morgan and Casey references; and/or
- (c) Morgan and Casey teach away from one another?

We answer this question in the negative.

FINDINGS OF FACT

The following findings of fact are supported by a preponderance of the evidence. Additional findings of fact as necessary appear in the Analysis portion of the opinion.

Morgan teaches a method and apparatus used in conjunction with CT imaging for medical purposes, or for industrial, security, and other types of volume imagining (col. 1, ll. 5-10).

Appellants do not dispute the Examiner's findings that Morgan describes a CT scanning method for acquiring a projection data set as claimed except that Morgan fails to disclose that the rotational period of the distributed X-ray source is greater than 8 seconds (Ans. 3-4). To remedy this deficiency, the Examiner relies upon Casey, which describes that a commercial CT scanner may have, for example, a rotational period of 8 seconds. Casey states that:

[t]he quality of the tomographic image will depend in part on the number of projections acquired[.] Often a lower resolution may be acceptable when faster scanning speed is desired. *For example, a commercial CT machine may take up to 7872 projections per revolution during a single eight second revolution of the gantry. At a rotational speed of one revolution every two seconds, the data acquisition chain will permit the acquisition of only 1968 projections. The resultant lower resolution image produced by these fewer samples may be acceptable in some circumstances, such as in imaging a moving organ, where the elimination of motion induced blurring is an important consideration.*

(Casey, col. 1, l. 61 to col. 2, l. 5; emphasis provided.)

One of ordinary skill in the art would have appreciated that 8 seconds, as described in Casey, is merely an example of the rotational period, and that a slower rotational period would result in a higher resolution.

PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such

that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

The analysis of whether the subject matter of a claim is obvious “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court [or this Board] can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 127 S. Ct. at 1741. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 127 S. Ct. at 1739.

The discovery of an optimum value of a variable in a known process is usually a matter of obviousness for one of ordinary skill in the art. *Cf. Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1368 (Fed. Cir. 2007). This is the kind of situation that requires an appellant to show secondary considerations such as unexpected results or criticality to overcome the prima facie case. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *see also In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) and *In re Aller*, 220 F.2d 454, 456 (CCPA 1955).

ANALYSIS

Applying the preceding legal principles to the Factual Findings of the record in this appeal, we determine that Appellants have not shown that the evidence fails to support the Examiner's conclusion of obviousness.

Appellants' argument focuses on the propriety of modifying Morgan to result in the claimed rotational period of "greater than 8 seconds" (Br. 7-9; Reply Br. 2-8).

In the present case, a preponderance of the evidence supports the Examiner's finding that it would have been obvious to use a rotational period of greater than 8 seconds. Appellants contend there is no motivation to do so (App. Br. and Reply Br., generally). We disagree, essentially for the reasons well stated by the Examiner.

As the Examiner aptly pointed out, one of ordinary skill in the art would have appreciated that optimizing the rotational period was known such that an image of appropriate resolution would be obtained (Ans. 13). The Examiner also explicitly found that "[m]odifying and/or upgrading a CT to accommodate additional projection data is well within the capabilities" of the artisan (Ans. 15). Appellants did not dispute these findings, rather they contend that neither reference teaches a rotational speed of "greater than 8 seconds" (Reply Br. 3).

However, one of ordinary skill in the art is also a "person of ordinary creativity, not an automaton". *KSR*, 127 S. Ct. at 1742. One of ordinary skill in the art would have recognized from the applied prior art that the rotational period was a result effective variable. Optimizing known result effective variables is ordinarily prima facie obvious. *See In re Boesch*, 617 F.2d at 276.

Furthermore, the claimed range of “greater than 8 seconds” encompasses, e.g., 8.01 seconds, such that the example range of 2-8 seconds for the rotational period taught in *Casey de facto* touches the range recited in the claim. A prima facie case of obviousness also exists where the claimed range and prior art range do not overlap but are close enough that an artisan would expect the same results. See, e.g., *In re Geisler*, 116 F.3d 1465, 1469 (Fed. Cir. 1997); *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782-83 (Fed. Cir. 1985).

One of ordinary skill in the art would have expected that using a rotational period of, e.g., 8.01 seconds, for Morgan’s CT scanner would yield substantially the same result as the rotational period of “8 seconds” as taught in *Casey* for a commercial CT scanner.

Thus, the burden is on Appellants to establish with objective evidence that the change is critical, i.e., it leads to a new unexpected result. See *In re Woodruff*, 919 F.2d at 1578. Appellants present no convincing evidence of unexpected results on this record.

We reject Appellants’ argument that Morgan’s teachings regarding solving the problem of long imaging times is tantamount to the sort of “teaching away” that is evidence of nonobviousness (App. Br. 10). Certainly, skill in the art is presumed and we find that one of ordinary skill in the art would have found it obvious to weigh the advantages and disadvantages of a longer or shorter rotational period, especially in light of all the circumstances detailed below. Just as it is obvious for one of ordinary skill in the art to eliminate a feature of the prior art along with its attendant advantage, it also is obvious to employ a feature of the prior art along with

its known disadvantage. *See e.g., In re Thompson*, 545 F.2d 1290, 1294 (CCPA 1976); *In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975).¹

Appellants argue that the trend in the art is to decrease the rotational period (Reply Br. 5). Even assuming that this is true, the trade-offs and benefits associated with the length of the rotational period would be familiar to those in the relevant art. Indeed, even Morgan teaches, *as an alternative* to using all fan beams simultaneously “providing [the] maximum number of image slices in the shortest time”, to instead “alternate or cycle selected subsets of multiple fan beams, perhaps to cover a larger volume”, which would take more time (col. 5, l. 65 to col. 6, l. 5). Additionally, claim 1 does not require that the “volume of interest” (i.e., the object to be scanned) is moving, and an artisan would understand that minimizing the rotational speed would be less of a concern for stationary objects.

For the foregoing reasons and those stated in the Answer, we agree with the Examiner’s findings in support of obviousness for claim 1 based on the combined teachings of Morgan and Casey.

CONCLUSION

Appellants have not shown that the Examiner reversibly erred in rejecting claim 1 under 35 U.S.C. § 103 because the claimed feature of “a rotational period of the distributed X-ray source is *greater than* 8 seconds” is

¹ *See also In re Boe*, 355 F.2d 961, 965 (CCPA 1966) (“All of the disclosures in a reference must be evaluated for what they fairly teach one of ordinary skill in the art. Thus, . . . this court affirmed rejections based on art which we concluded rendered the claimed invention obvious to those of ordinary skill in the art despite the fact that the art teachings relied upon in all three cases were phrased in terms of a non-preferred embodiment or as being unsatisfactory for the intended purpose.”)

missing from the references (claim 1; emphasis provided). For the reasons set out above and in the Examiner's Answer, Appellants' contentions that there is no motivation to combine the Morgan and Casey references, and that Morgan and Casey teach away from one another, are not persuasive of any reversible error in the Examiner's obviousness determination.

ORDER

All of the rejections made by the Examiner under 35 U.S.C. § 103 are affirmed; specifically, the rejection of claims 1, 9, 17, and 25 as being unpatentable over Morgan in view of Casey is affirmed; the rejection of claims 2-5, 10-13, 18-21, and 26 as being unpatentable over the combined teachings of Morgan, Casey, and Yamagishi is affirmed; and, the rejection of claims 6, 7, 14, 15, 22, and 23 as being unpatentable over the combined teachings of Morgan, Casey, Yamagishi and Taguchi is affirmed.

The Examiner's decision is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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